HYPERICUM ADPRESSUM (CLUSIACEAE) NEW TO ARKANSAS AND THE OUACHITA MOUNTAINS, U.S.A

C. Theo Witsell

Arkansas Natural Heritage Commission
1500 Tower Building
323 Center St.
Little Rock, Arkansas 72201, U.S.A
theo@arkansasheritage.org

ABSTRACT

Hypericum adpressum Bart. (Clusiaceae) is reported as new to the state of Arkansas. It was collected from a complex of natural depression wetlands in the eastern Ouachita Mountains of Saline County. A description of the habitat and list of associated species is provided.

RESUMEN

Se cita *Hypericum adpressum* Bart. (Clusiaceae) como nuevo del estado de Arkansas, en un complejo de depresiones pantanosas naturales en las montañas Ouachita del este del condado de Saline. Se aporta una descripción del hábitat y una lista de especies asociadas.

INTRODUCTION

Creeping St. John's wort, *Hypericum adpressum* Bart., (Fig. 1) is endemic to the eastern United States and is considered to be a species of conservation concern in all 19 states from which it is known (NatureServe 2006). Based on data from state natural heritage programs, this species is considered to be extant in 14 states, with a state conservation status rank of either S1 (critically imperiled) or S2 (imperiled), and is considered to be extirpated or possibly extirpated in 5 states. It has a global conservation status rank of G3 (vulnerable) and has the following ranks in each state: CT (SH), DE (S2), GA (S2?), IL (S1), IN (S1), KY (SH), MD (S1), MA (S2), MI (S1), MO (S1), NJ (S2), NY (S2), NC (SH), PA (SX), RI (S2), SC (S1), TN (S1), VA (S1), and WV (SH), where S1 = critically imperiled, S2 = imperiled, SH = possibly extirpated, and SX = presumed extirpated (NatureServe 2006). Habitats listed for the species include marshes, shores, marshy shores, wet meadows, bogs, swales, ditches, moist depressions in sand prairies, and along the shores and in shallow water zones of freshwater ponds (Gleason & Cronquist 1991; Godfrey & Wooten 1981; Radford et al. 1968; Yatskievych 2006; Enser 2001).

Hypericum adpressum was listed (as a woody plant) for Arkansas without comment or citation of a voucher by Moore (1941) and was also listed without comment or citation by Demaree (1943). Tucker (1976) excluded it from his treatment of the woody flora of Arkansas, noting its inclusion by Moore (1941) in a checklist of the ligneous flora of Arkansas despite the species being "wholly herbaceous." Smith (1988; 1994) excluded the species altogether from the flora of Arkansas noting that while Moore (1941) and Demaree (1943) included it, Adams (1973) did not include Arkansas in the range for *H. adpressum*. No specimens of the species have been reported in the recent inventory of herbaria by the Arkansas Vascular Flora Committee, who excluded it from the 2006 *Checklist of the Vascular Plants of Arkansas* (Arkansas Vascular Flora Committee 2006).

On 12 April 2006, while surveying a complex of natural depression wetlands on a terrace of the Alum Fork Saline River in northern Saline County, I observed several large colonies of young sterile stems and the previous year's dead stems of a rhizomatous, perennial *Hypericum* growing on the margins of two ponds (Fig. 2). Based on the habitat and rhizomatous character of the plants, I thought the plants might be *H. adpressum*, which I had seen in southeastern Missouri the previous year. Two rammets were removed from the Alum Fork population and maintained in cultivation until mid June 2006, when the plants began to flower. Based on reproductive features I confirmed that the plants were *H. adpressum*. I returned to the site on 21 June 2006 to collect voucher specimens, take photographs, and collect data for the Arkansas Natural Heritage

Fig. 1. *Hypericum adpressum*. Saline County, Arkansas. Note revolute leaf margins. 20 June 2006.

Fig. 2. Habitat for *H. adpressum* in abandoned channel depression ponds on terrace of Alum Fork Saline River. Saline County, Arkansas. Emergent plants in foreground are stems of *H. adpressum*. 20 June 2006.

Program. I visited the ponds again on 17 August 2006 to collect fruiting specimens and conduct additional inventory. Tens of thousands of stems of *Hypericum adpressum* were found along the margins of these ponds within the zone of seasonal water fluctuation. The ponds were nearly dry on 17 August 2006.

Voucher Specimens: **ARKANSAS. Saline Co.:** Ouachita Mountains, locally common in zone of seasonal water fluctuation around several natural ponds on terrace above Alum Fork Saline River, 0.4 mi (0.6 km) SW of Lake Winona Dam, N34.79247, W92.85592 (NAD 83, Zone 15), Paron 7.5' quad. (specimen in flower), 20 Jun 2006, *T. Witsell & J. Pelton* 06-273 (anhc [herbarium of the Arkansas Natural Heritage Commission], MO, UARK); same locality (specimen in fruit), 17 Aug 2006, *T. Witsell* 06-397 (anhc [herbarium of the Arkansas Natural Heritage Commission], MO, UARK).

DISCUSSION

Natural depression wetlands are found along several of the larger streams in the Ouachita Mountains and are known to support disjunct or relict populations of plant species more typical of the Gulf Coastal Plain and Mississippi Alluvial Plain Ecoregions (e.g. *Pinus taeda* L., *Quercus lyrata* Walter, *Myrica cerifera* L., *Carex hyalinolepis* Steud., *C. gigantea* Rudge., *C. lupuliformis* Sartwell ex L.H. Dewey, *Eleocharis microcarpa* Torr., *Panicum verrucosum* Muhl., *Eupatorium album* L. var. *glandulosum* (Michx.) DC., *Acer rubrum* L. var. *drummondii* (Hook. & Arn. ex Nutt.) Sarg., *Lyonia mariana* (L.) D. Don., *Planera aquatica* J. F. Gmel., and *Taxodium distichum* (L.) Rich). Geomorphologically, these wetlands occur in abandoned stream channel scars on older stream terraces above present day floodplains. Along the Alum Fork Saline River, Middle Fork Saline River, and North Fork Saline River in the eastern Ouachita Mountains, these wetlands typically occur as small 0.1

to 1.6 ha (0.25 to 4 acre) forested depressions similar in appearance and species composition to the hydric flatwoods of the Mississippi Alluvial Plain and Gulf Coastal Plain. These wetlands are poorly drained, have clay soils, and typically have standing water up to 10 cm deep in the winter and spring but dry out on the surface in the summer. They are typically dominated by *Quercus phellos* L., *Quercus nigra* L., *Liquidambar styraciflua* L., *Fraxinus pennsylvanica* Marshall (and in rare cases support *Planera aquatica*, *Quercus lyrata* and *Taxodium distichum*) with scattered shrubs and a graminoid understory rich in sedges (*Carex* and *Eleocharis* spp.) and rushes (*Juncus* spp.) and often with extensive bryophyte cover (particularly *Sphagnum* spp.).

In at least three sites on the Alum Fork and North Fork in northern Saline County, these wetlands occur with deeper, open water ponds fringed by concentric zones of emergent herbaceous vegetation and shrubs. Water levels fluctuate throughout the growing season as water is lost to evaporation, exposing a ring of mudflats colonized primarily by annual species. The ponds at the Alum Fork site are dominated by open water with a fringe of scattered *Cephalanthus occidentalis* and dense stands of emergent vegetation dominated by perennial species including *Juncus effusus* L., *Juncus nodatus* Coville, *Carex lurida* Wahlenb., *Carex joorii* L.H. Bailey, *Carex ozarkana* P. Rothr. & Reznicek, *Carex gigantea* Rudge*, *Dulichium arundinaceum* (L.) Britton*, *Rhynchospora glomerata* (L.) Vahl, *Scirpus cyperinus* (L.) Kunth, *Rhexia virginica* L., *Xyris jupicai* Rich., *Viola lanceolata* L., *Eleocharis quadrangulata* (Michx.) Roem. & Schult. in Roem. et al, *Sagittaria platyphylla* (Engelm.) J.G. Sm., *Hypericum lobocarpum* Gatt., *Triadenum walteri* (J.F. Gmel.) Gleason, and *Panicum rigidulum* Bosc ex Nees. As the water recedes over the course of the summer, *Hypericum mutilum* L., *Eleocharis obtusa* (Willd.) Schult., *Eleocharis microcarpa* Torr.*, *Oldenlandia boscii* (DC.) Chapm., *Lindernia dubia* (L.) Pennell, and *Gratiola brevifolia* Raf.* dominate the exposed soil of the pond margins along with the perennial *Juncus repens* Michx. [* = species tracked as elements of conservation concern by the Arkansas Natural Heritage Commission].

The presence of small spoil piles with trees growing on them around several of the ponds at the Alum Fork site indicate that they were partially excavated in the past in an attempt to deepen them, perhaps as a source of water for cattle. However, it is clear from the size of the ponds relative to the size of the spoil piles as well as the physical, geomorphological, and floristic similarity of these ponds to undisturbed terrace wetlands nearby that they are natural wetlands.

Aside from *H. adpressum*, there are 15 taxa of *Hypericum* known from Arkansas (Arkansas Vascular Flora Committee 2006). Of these, *H. sphaerocarpum* Michx., which is also often rhizomatous and herbaceous, is the most likely to be confused with *H. adpressum*. It can be distinguished from *H. adpressum* by its flat leaf margins (vs. revolute in *H. adpressum*), its broadly ovoid to globose seed capsules with 4 to 8 seeds (vs. ellipsoid to ovoid capsules with numerous seeds in *H. adpressum*), and 2.0 to 2.7 mm long seeds (vs. 0.6 to 0.8 mm in *H. adpressum*) (Yatskievych 2006). *H. sphaerocarpum* often also has suffrutescent lower stems and rootstock (vs. entirely herbaceous in *H. adpressum*) (Yatskievych 2006). In Arkansas *H. sphaerocarpum* is typically found in calcareous glades and woodlands, shale barrens, and prairies, but is reported also from banks of streams and rivers, fens, and margins of ponds and lakes in Missouri by Yatskievych (2006). *H. punctatum* Lam., *H. perforatum* L., and *H. pseudomaculatum* Bush ex Britton are occasionally rhizomatous but differ from *H. adpressum* by having characteristic black glands on the sepals and/or petals.

The nearest known extant site to the Saline County population for *H. adpressum* is approximately 395 km (245 miles) to the northeast in Scott County, Missouri where it occurs in a moist depression in a sand prairie near Blodgett in the Mississippi Alluvial Plain (Tim Smith pers. comm.; NatureServe 2006). There are also two historical collections from Mississippi and Scott Counties, Missouri, both from 1933. (Tim Smith pers. comm., Yatskievych 2006); Aside from these records, *H. adpressum* is known only from east of the Mississippi River (NatureServe 2006). It is possible that the inclusion of *H. adpressum* for Arkansas by Moore (1941) and Demaree (1943) was based on a misidentified specimen that has since been annotated as another *Hypericum* species or that it was based on a properly-identified sight record or a specimen now lost.

When garden-grown plants of *H. adpressum* were compared to in situ plants of their parent population

it was apparent that the cultivated plants, which grew in pots with well-drained soil that was allowed to dry out on occasion, branched profusely from the axils of the lower leaves (a condition absent in the wild plants). Wild plants also frequently had a shiny upper leaf surface compared to dull upper leaf surfaces in the cultivated plants. Both wild and cultivated plants grew in full sun. Wild plants in the wettest zones of the pond margins had a spongy, thickened lower stem consistent with plants called variety *spongiosum* by Robinson (1902) which was later downgraded to forma *spongiosum* by Fernald (1949). Both this form and the more typical form without this character were present in the population and were obviously correlated to the amount of water present where they grew.

ACKNOWLEDGMENTS

Thanks to Paul McKenzie (US Fish and Wildlife Service), Tim Smith, and Bob Gillespie (both of the Missouri Department of Conservation) for showing me plants of *H. adpressum* in the field in southeastern Missouri in 2005. This certainly led to my finding it in Arkansas. Thanks also to George Yatskievych for additional information on the species in Missouri and to John Pelton for the photographs of the plant and habitat. Tanya Miller-Witsell provided a Spanish translation of the abstract. Jennifer Akin, Staria Vanderpool and an anonymous reviewer provided comments which strengthened an earlier draft of this manuscript. Thanks also to Karen Smith and Bill Holimon of the Arkansas Natural Heritage Commission.

REFERENCES

Adams, P. 1973. Clusiaceae of the southeastern United States. J. Elisha Mitchell Sci. Soc. 89:62—71.

Arkansas Vascular Flora Committee. 2006. Checklist of the vascular plants of Arkansas. University of Arkansas Herbarium. Fayetteville.

Demaree, D. 1943. A catalogue of the vascular plants of Arkansas. Taxodium 1:1—88.

Enser, R.W. 2001. *Hypericum adpressum* (creeping St. John's-wort) conservation and research plan. New England Wild Flower Society. Framingham, MA, USA (http://www.newfs.org).

Fernald, M.L. 1949. *Hypericum adpressum* Bart., forma *spongiosum* (Robinson), stat. nov. Rhodora 51:112.

Gleason, H.A. and A. Cronquist. 1991. Manual of the vascular plants of northeastern United States and adjacent Canada. New York Botanical Garden Press. Bronx.

Godfrey, R.K. and J.W. Wooten. 1981. Aquatic and wetland plants of the southeastern United States, dicotyledons. University of Georgia Press. Athens.

Moore, D.M. 1941. Checklist of the ligneous flora of Arkansas. Proc. Ark. Acad. Sci. 1:41—55.

NatureServe. 2006. NatureServe Explorer: an online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, VA. availablehttp://www.natureserve.org/explorer. (Accessed January 25, 2007).

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the vascular flora of the Carolinas. University of North Carolina Press. Chapel Hill.

Robinson, B.L. 1902. Two new *Hypericums* of the *adpressum* group. Rhodora 4:135—137.

Smith, E.B. 1988. An atlas and annotated list of the vascular plants of Arkansas, 2nd ed. Privately printed. Fayetteville, AR.

Smith, E.B. 1994. Keys to the flora of Arkansas. University of Arkansas Press. Fayetteville.

Tucker, G.E. 1976. A guide to the woody flora of Arkansas. Ph.D. dissertation. University of Arkansas at Fayetteville., AR.

Yatskievych, G. 2006. Steyermark's flora of Missouri. Volume 2. Missouri Botanical Garden Press. St. Louis, MO.